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SAMUEL FELTMAN
AMMUNITION LABORATORIES

PICATINNY ARSENAL
DOVER, N. J.

FRAGMENTATION TEST

RECORD NO. 288

DATE August 1954

SUBJECT: Development of Optimum Mortar & Ammunition Therefor

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**PICATINNY ARSENAL
FRAGMENTATION TEST RECORD NO. 288**

DATE: August 1954
TEST RECORD NO: 288

REFERENCE: Development of Optimum Mortar & Ammunition Therefor
(Project No. TAL-1402), Contract DAI-36-034-501-ORD-(P)-12

DESCRIPTION OF AMMUNITION:

a. Two thick-walled Pyrex glass cylinders closed off at each end by means of a wooden plug; the plug inserted in one end of each of the two cylinders, containing a threaded hole designed to accommodate an M52 (Mod) Fuse. The two cylindrical glass bomb assemblies were loaded with 67/33 Baratol to within 1" of the bottom surface of the respective wooden fuze plugs on each of the cylinders; the remaining 1" of volume above the 67/33 Baratol surfaces, respectively, were filled with a Comp B top-off as a means of facilitation initiation.

b. Two thick-walled, bell-shaped glass containers, (heat-shock resistant made from tempered glass) again, closed off at their open ends by wooden plug stoppers each of which was threaded to accommodate an M52 (Mod) Fuse. The two bell-shaped glass bomb assemblies were loaded with 67/33 Baratol to within 1" of the bottom surface of the respective wooden fuze plugs, as was the case with the cylindrical bombs, above; as before, the remaining 1" of volume above the 67/33 Baratol powder surfaces, respectively, were filled with a Comp B "top-off" as a means of facilitating initiation.

DRAWING NO: None

QUANTITY IN LOT: 4 (2 cylindrical; 2 bell-shaped)

QUANTITY FRAGMENTED: 4

METHOD OF FUNCTIONING:

Modified M52 Fuse, Drawing No. 73-1-161 initiated with Corps of Engineers blasting cap.

4 glass "bombs" fragmented at ambient temperature (2 cylindrical)
(2 bell-shaped) all 67/33 Baratol- loaded with a Comp B top-off.

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FRAGMENTATION PROCEDURE:

4 glass "bombs" fragmented at ambient, all 67/33 Baratol loaded with a Comp B top-off. Bomb assembly equipped with electric ignition fragmented in sawdust in the unconfined condition, i.e., fragmented in a pile of sawdust in open air rather than in the conventional fragmentation tub.

PURPOSE OF TEST:

The objective of this test was to determine the fragmentation properties of the above HE-loaded glass "bombs", as part of a program designed to explore the feasibility of making mortar shell bodies from glass of various types.

FRAGMENTATION RECOVERY AND CLASSIFICATION:

Some fragments were manually recovered; however, both the quantity and mass of fragments was insufficient to permit classification by weight grouping in accordance with the prescribed weight zones.

The above glass cylinders and bell jars which were fragmented during the course of this test were furnished by the Budd Company of Philadelphia, Pa. The cylindrical glass bombs were manufactured from thick-walled, Pyrex glass. The bell-shaped glass bombs were manufactured from heat-shock resistant tempered glass.

DISCUSSION AND CONCLUSIONS:

Based on the limited data available, the following observations were made:

The major portion of the glass was either blown to powder or fused and was so changed as to be hardly recognizable as being derived from the original unfragmented glass. Also, it was impossible to recover more than a relatively small portion of the total number of fragments (because of their smallness and fragile condition) in spite of the fact that the method of recovery was considered suitable for recovery of glass fragments.

In view of the fact that only a small fraction of the total number of fragments produced were recoverable, (and these had a very weak, fused and "frothy" texture), it was concluded that the application of Pyrex and heat-shock resistant tempered glass to HE shell is not feasible.

REPORT BY:

G. FIARTEY

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- 8

APPROVED:

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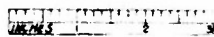
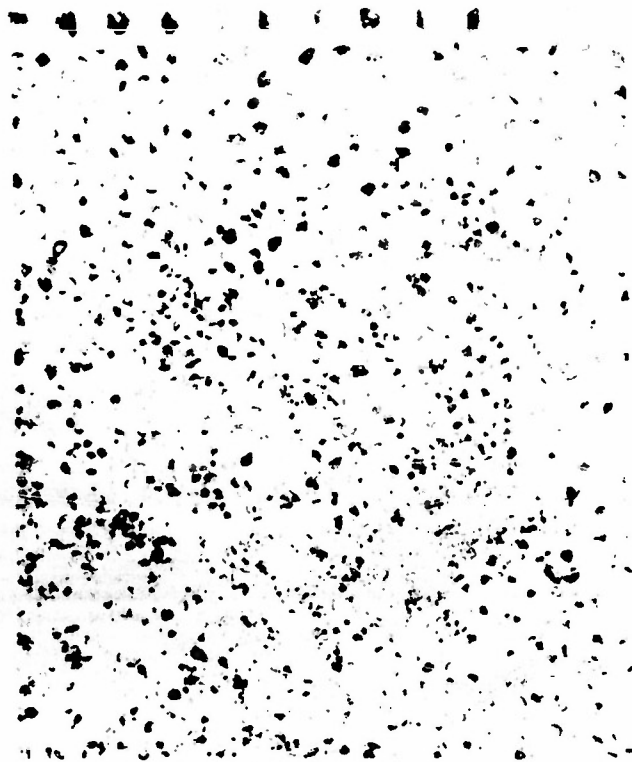
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